

Linking sustainable food production with genetic diversity maintenance to improve livelihoods

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Shared Vision:

- Sustainable agriculture
- Food and nutrition security for all
- Biodiversity conservation
- Poverty alleviation – improved livelihoods

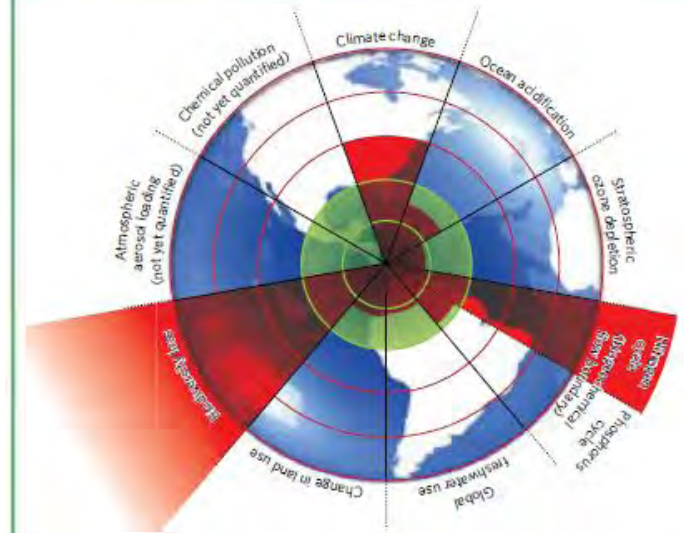


The Problem

- Growing population → Increasing food demand
- Competition for limited land area
 - Food production
 - Biodiversity conservation
 - (of course, other uses)
- Need to achieve 'safe operating space' for humanity

BOX 2.1 "A SAFE OPERATING SPACE FOR HUMANITY"

Modern Earth system science (including geology, climate science, hydrology, and ecology) makes clear that human activity is now dangerously impinging on some of Earth's vital life support systems through its impact on the global climate, the water cycle, the nitrogen cycle, biodiversity, ocean acidification, and pollution. A group of scientists has proposed the existence of certain thresholds, or planetary boundaries, beyond which the security of people in most countries is likely to face severe risks, including potential setbacks for human development. According to this framework, the boundaries for biodiversity loss, climate change, and nitrogen release have already been transgressed.



Source: Stockholm Resilience Centre.

Towards a Solution:

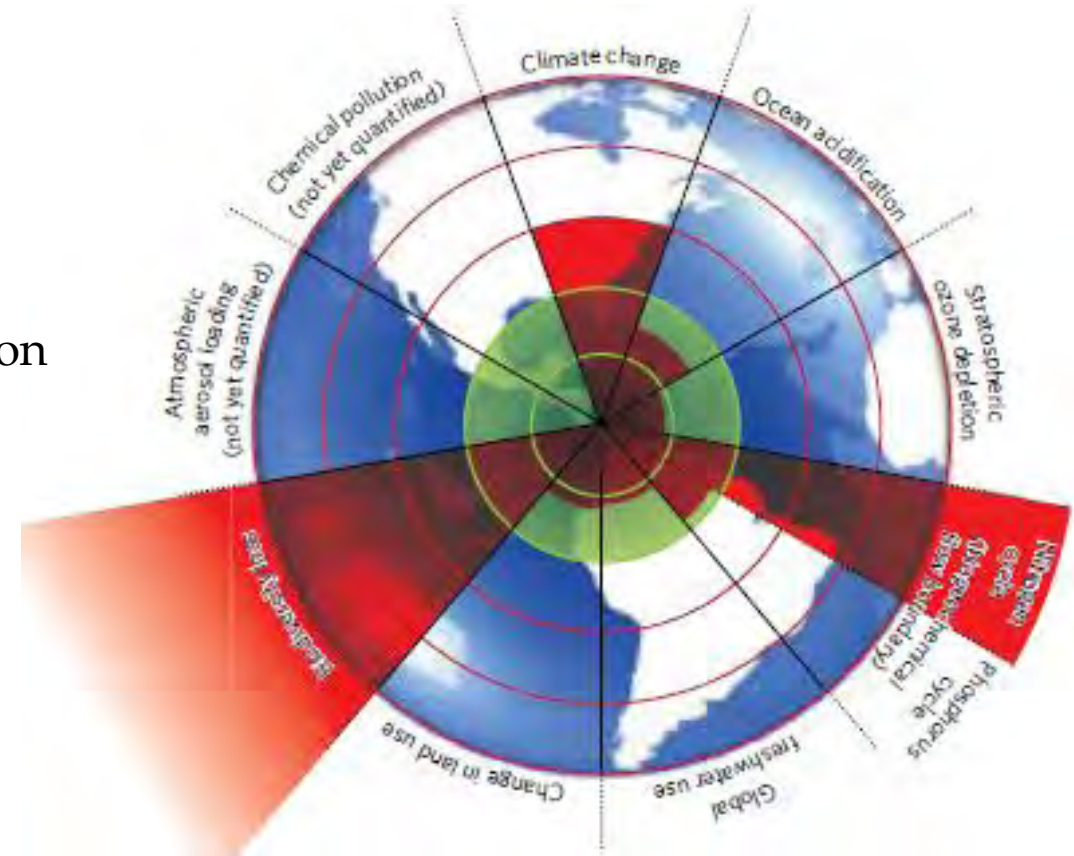
Forge synergies

- Biodiversity conservation
- Sustainable agricultural intensification
 - Reduced, stopped, or reversed land expansion
 - Reduced environmental footprint
 - Increased productivity and food security

Multi-sectoral partnerships

- Agriculture
- Environment
- Economics...

Develop options, facilitate, incentivize, advocate change



Actions:

- Consultatively develop indicators of farming system sustainability and productivity that meet productivity and environmental health objectives (Aichi targets 2, 3, 4, 5 and 7);
- Evaluate genetic diversity and incorporate indicators of agricultural biodiversity into farming system assessments (Aichi 13, 19);
- Discuss and elaborate models for incentive programs to enhance synergies between sustainable agricultural intensification, biodiversity conservation and improved livelihoods (Aichi 2 and 3);
- Build synergistic partnerships to conserve ecosystems for biodiversity conservation by sustainably increasing the productivity of farming systems (Aichi 7, 14)



CIMMYT's Expertise:

- Agriculture, especially related to maize and wheat systems
- Conservation, characterization and use of crop genetic resources
- Sustainable agricultural intensification
- Participatory development and evaluation of farming technology options
- Socio-economic assessment of agricultural value chains and livelihood opportunities



CIMMYT's Experience: Genetic Diversity

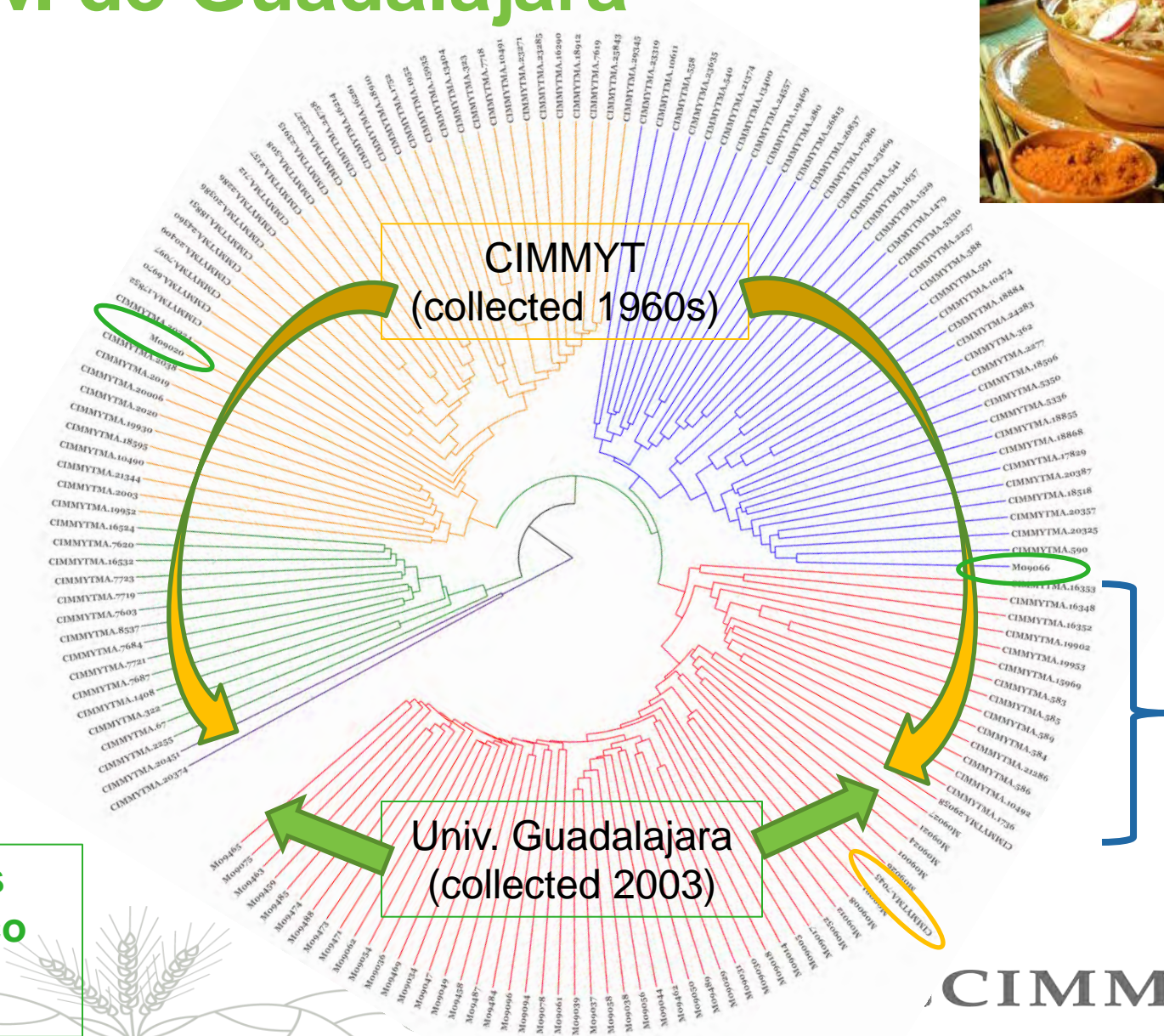
Moises Morales, Univ. de Guadalajara*



Elotes occidentales



Ears with 8-10 kernel rows; large grains; floury, purple grains



*Centro de Conservación de Recursos Fitogenéticos en el Occidente de México

BANCO DE GERMOPLASMA CUCBA

CIMMYT's Experience: Residue burning and its impacts

A growing problem in Northern India

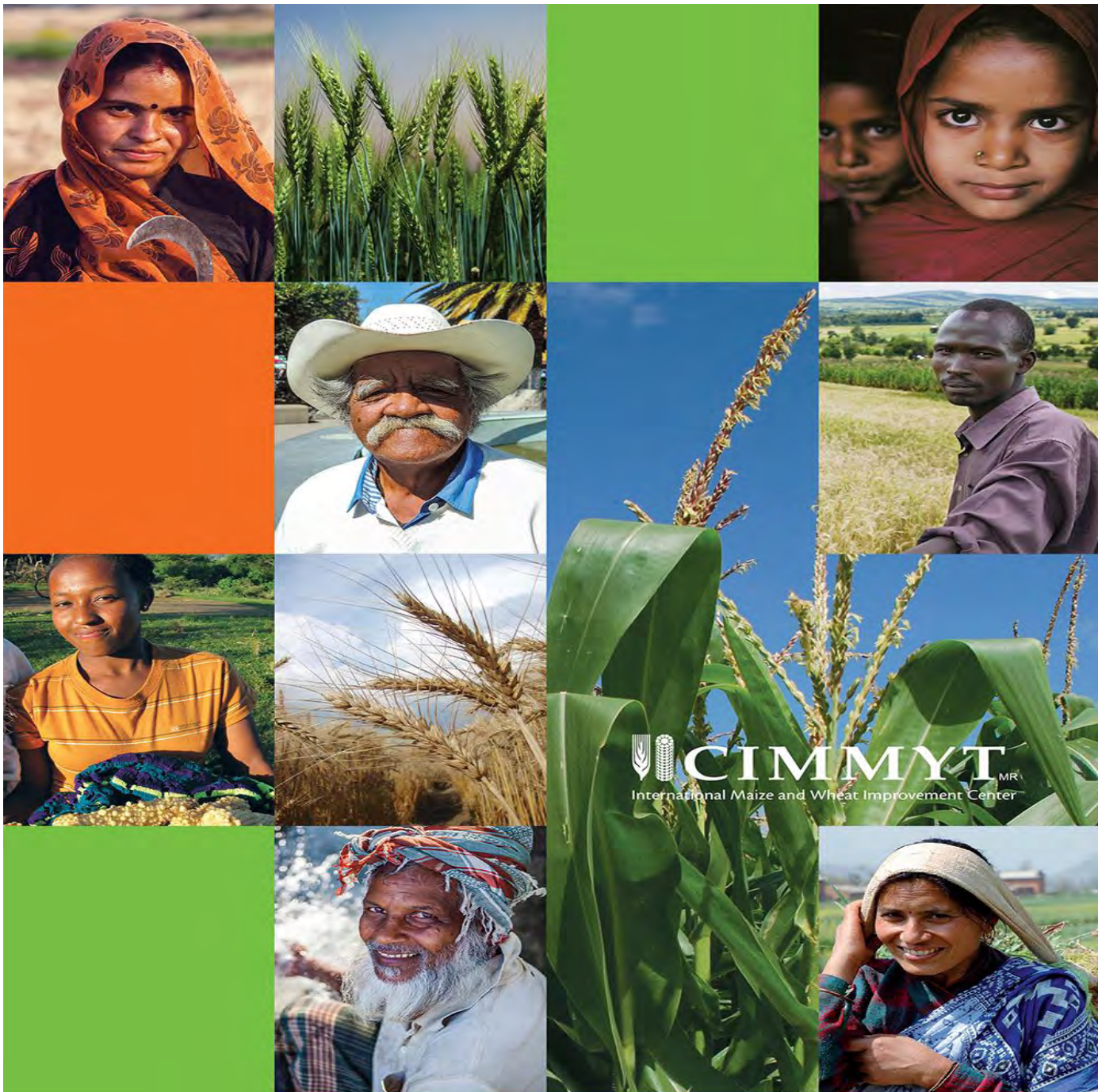
- ≈23 Mt of rice residue are burned each winter.
- Only ≈20% is recycled.
- Rice waste burning results in air pollution.
- Soil organic levels are half of historic levels
- Losses of soil nutrients
- Groundwater levels are declining
- Burning contributes to climate change.
 - accelerated snowpack melting in the Himalayas
 - changes in monsoon patterns



Key Elements of the Strategy:

- Close the **knowledge gap** that exists regarding Happy Seeders among farmers, government, and NGOs.
- Encourage the **growth of service providers** supporting Happy Seeder implementation.
- Provide **attractive subsidy and loan capital** to incentivize private sector implementation.
- **Align policy and government support systems** - extension and KVKs around this solution.





CIMMYT - technical and scientific cooperation to:

Forge synergies

- Biodiversity conservation
- Sustainable agricultural intensification

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